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Eastern White Pine

Forest Service
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EASTERN WHITE PINE

(*Pinus strobus*)

By H. S. Betts, *senior engineer, Division of Forest Products*

The lumber industry in the United States was founded on eastern white pine—a wood of exceptional all-around usefulness. For more than 250 years it was the leader in the lumber markets. Today the original forests of eastern white pine are mere fragments of what they were, and the bulk of the future supply must come from new growth. It is highly probable that this country will never again see (except in limited quantities) eastern white pine lumber of as high quality as that cut from trees which had been growing for centuries in our northeastern forests. Eastern white pine frequently grows in mixture with red (Norway) pine and jack pine, and the three have often been cut and sold together as "white pine." [1]

The existence of eastern white pine, in fact of all the white pines,[2] is seriously threatened by a disease known as the white-pine blister rust brought to this country from Europe about 1900. The spores of this disease develop on currant bushes (*Ribes*), which act as hosts. Only by destroying all growth of *Ribes* in an infected area is it possible to grow white pine successfully.

In September 1938 a hurricane swept through the New England States causing property damage aggregating millions of dollars. It is estimated that about one-third of the stand of eastern white pine in New England was blown down or damaged. The most serious forest damage occurred in the areas tributary to the Connecticut River—eastern Vermont, western New Hampshire, and north central Massachusetts.

Nomenclature.—Eastern white pine is also known as white pine, northern white pine, northern pine, Weymouth pine, soft pine, and spruce pine. The name "white pine," however, is much more commonly used than any of the others, but is often also applied to pines other than *Pinus strobus*, whose wood is more or less similar in quality.

Distribution and growth.—Eastern white pine grows from Newfoundland to Lake Winnipeg in Canada and southward through the Lake States and the New England States, and in the Appalachians as far south as northern Georgia. (See fig. 1 for range in the United States.) It grows best in the humid and cool situations common in northern latitudes. Under favorable conditions it reaches heights of 100 feet or more and diameters of 3 to 6 feet. Trees over 200 feet high have been reported. Extensive stands containing from 25,000 to 50,000 feet to the acre were formerly not uncommon. Eastern white

[1] This practice has become less common in recent years in the larger mills in the Lake States.

[2] The commercial white pines include eastern white pine (*Pinus strobus*), western white pine (*Pinus monticola*), and sugar pine (*Pinus lambertiana*).

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pine in New England grown under favorable conditions averages 1.7 inches in diameter and 7.2 feet in height at 10 years, 8.6 inches in diameter and 61 feet in height at 40 years, and 16.5 inches in diameter and 101 feet in height at 80 years. In the Lake States its growth is somewhat slower.

Eastern white pine bears cones 5 to 11 inches long which mature and distribute their seeds in the fall of the second year after they are formed. The seeds are equipped with wings, and in some cases may

FIGURE 1.—Range of eastern white pine (*Pinus strobus*) in the United States.

be carried half a mile or more by the wind if the parent tree is in an exposed location. Much of the seed, either while in the cone or after it falls to the ground, is consumed by birds and rodents. Seedlings grow best in moist, well-drained sandy or loamy soils protected by vegetation or leaf litter. They require an intermediate amount of light as compared to associated species—more than eastern hemlock or eastern spruce and less than red pine or jack pine. Eastern white pine is a hardy tree and reproduces satisfactorily both naturally and by artificial seeding or planting if protected from blister rust, which is especially destructive to seedlings and young trees.

When trees stand close together in the forest, the lower branches frequently die from lack of light. On eastern white pine trees these dead limbs are often retained for 50 years or more and cause the knots characteristic of lumber cut from comparatively young trees. Such trees furnish practically all of the eastern white pine lumber now produced in the Northeast. It is only after the dead limbs are broken off by the swaying branches of nearby trees, or are removed by decay or other means, that clear wood is formed from which high-grade lumber free from knots can be sawed. A high proportion of such lumber was present in the large trees common in the original forests of eastern white pine.

Supply.—The original stand of eastern white pine in both the United States and Canada has been estimated [3] at 750 billion board feet. About 350 billion feet was in the Lake States and 400 billion feet in the Eastern States and Canada. Probably 20 percent of the total was in Canada. An estimate made in 1938 [4] placed the stand of eastern white pine of saw-timber size in the United States at 18,101,000,000 board feet including approximately 12,000,000,000 board feet in the Northeastern States,[5] 1,000,000,000 board feet in the southern Appalachian Mountains, and 5,000,000,000 board feet in the Lake States.[6]

Later estimates, made about 1940, indicated a stand of eastern white pine in the United States of approximately 15,000,000,000 board feet distributed as follows:

Region	*Stand (million board feet)*	
Lake States:		
Minnesota	[1] 1,598	
Michigan	[1] 1,010	
Wisconsin	[1] 1,145	
		3,753
Northeastern States: [2]		
Maine	4,470	
New Hampshire	780	
Vermont	350	
Massachusetts	620	
Connecticut	20	
Rhode Island	30	
New York	2,930	
Pennsylvania	600	
		9,800
Southern Appalachian Mountain States: [2]		
Virginia	410	
West Virginia	100	
Kentucky	65	
Tennessee	170	
North Carolina	420	
South Carolina	100	
Georgia	190	
		1,455
Total stand in United States		15,008

[1] See CUNNINGHAM, R. N., and MASON, H. C. FOREST AREAS AND TIMBER VOLUMES IN THE LAKE STATES. Lake States Forest Expt. Sta. Econ. Note 10, 10 pp. 1938. (Processed.)

[2] Figures for the Northeastern and Southern Appalachian States are estimates based on such information as was available at the time the estimates were made. These figures are, of course, subject to change when forest surveys are completed in the States involved.

[3] See U. S. FOREST SERVICE. TIMBER DEPLETION, LUMBER PRICES, LUMBER EXPORTS, AND CONCENTRATION OF TIMBER OWNERSHIP. Rpt. on Senate Res. 311, 66th Cong., 71 pp. 1920.

[4] See U. S. FOREST SERVICE, FOREST LANDS OF THE UNITED STATES. Joint Committee on Forestry, 77th Cong., 1st sess., Senate Doc. 32, 44 pp. 1941.

[5] This estimate was made before the New England hurricane of 1938 which is reported to have blown down about 2,500,000,000 board feet of merchantable timber, of which over 2,000,000,000 board feet was Eastern white pine.

[6] This estimated stand of eastern white pine in the Lake States includes jack pine and red pine.

Heavy cutting of eastern white pine to meet war demands for boxing and crating lumber and for temporary construction material, especially in the Northeastern States, has probably reduced the stand to approximately 12,000,000,000 board feet.

Production.—The production of eastern white pine lumber started in New York about 1630 and soon spread to New England and Pennsylvania. For 200 years the pine forests of the Eastern States continued to produce increasing quantities of lumber. By 1840 the original growth in the Northeast was pretty well cut out, and lumbering in the magnificent pineries of the Lake States was under way. During the next 40 or 50 years the production of lumber in the Lake States increased markedly in volume. In 1889 the total cut of eastern white pine [7] in the United States reached a maximum of 9,409,000,000 board feet (fig. 2). Of this total over 7,000,000,000 board feet came from Michigan, Wisconsin, and Minnesota, and the remainder from 18 other States. Twenty years later (1909)[8] production had dropped to 3,695,000,000 board feet.

Since that time production has continued to fall off and in 1932, a year of business depression, dropped to 198,000,000 board feet, or approximately one-fiftieth of its maximum in 1889. This shrinkage in production in recent years is even greater than the figures indicate since the quantities reported as "white pine" in the lumber cut returns from the Lake States include increasing amounts of jack pine and substantial amounts of red pine. Production figures for eastern white pine from other States within its range include only negligible amounts of other species.

The average annual reported cut of eastern white pine for the 10-year period 1933–42 was 538,600,000 board feet. This is equivalent to approximately 472,400,000 board feet after making an allowance for the jack pine and red pine included in the reported figures. The 1942 production reached 1,083,000,000 board feet—the greatest since 1923. It came from 24 States. The figure for 1942 adjusted to include only eastern white pine would be approximately 970,000,000 board feet. In 1943 production was only slightly less than that of 1942.

The leading States in the production of eastern white pine lumber in 1869 [9] were Wisconsin, Pennsylvania, and New York. A few years later Michigan took the lead and held it for some 25 years during the period when production of eastern white pine lumber was at its peak. Up to 1935 more lumber had been cut from the forests of Michigan, largely during this 25-year period, than from any other State except Washington.[10] In 1899 Wisconsin again became the leading State in the production of eastern white pine lumber with Minnesota and Michigan ranking second and third. In 1904 Minnesota took first place, and held it until 1931 when Maine took the lead with New Hampshire second. During the period 1933–1942 New Hampshire ranked first in the production of eastern white pine in 6 of the 10 years and Maine in 4.

In 1942 the three leading States were New Hampshire, Maine, and Minnesota. Together they furnished about 60 percent of the cut.

[7] Includes some red pine.

[8] It was in 1909 that lumber production in the United States, including all species, reached its all-time maximum of approximately 44,500,000,000 board feet.

[9] Records are not available to show the leading States during an earlier period when lumber operations were centered in New England.

[10] Washington led in total cut and in softwood production, while Michigan led in hardwood production and was second in softwood production.

Eastern white pine lumber from the Northeastern States is now cut almost entirely from second-growth trees and that from the Lake States partly from the few remaining stands of virgin or old-growth timber.

Properties.—The heartwood of eastern white pine is light brown, often with a reddish tinge. It turns considerably darker on exposure. The narrow or medium wide sapwood is white tinged with yellow. The freshly cut wood has a slightly resinous odor. The growth rings are distinct. They contain a comparatively wide band of light-colored springwood which merges gradually into a narrow band of darker summerwood. The wood has a comparatively uniform texture, is easy to work with tools, has a small shrinkage, is easily kiln-dried, ranks high in ability to stay in place, can be readily glued, and is straight-grained. It does not split easily in nailing

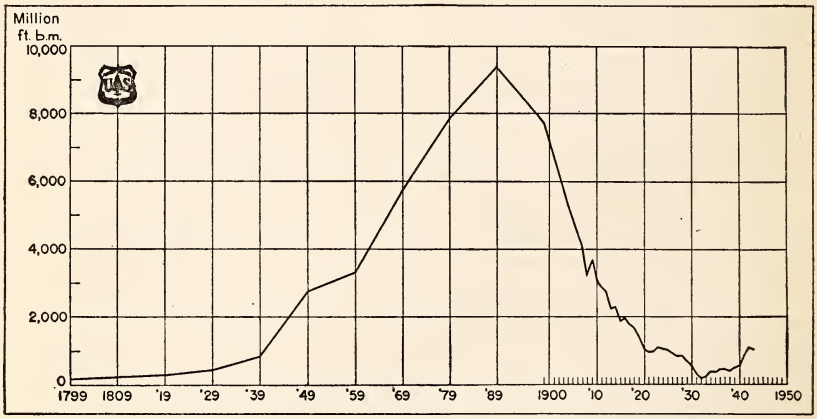

FIGURE 2.—Lumber production of eastern white pine (*Pinus strobus*), 1799–1943, including comparatively small quantities of red pine (*Pinus resinosa*) and jack pine (*Pinus banksiana*).

and has an intermediate position in nail-holding ability. Eastern white pine is light in weight,[11] moderately soft, moderately weak, not stiff, and ranks low in resistance to shock. The wood takes and holds paint excellently. In ability to resist decay it has an intermediate rank.[12]

Principal uses.—Practically all of the eastern white pine removed from the forest in logging operations is converted into lumber.[13] This lumber has probably been put to a greater variety of uses than that of any other wood except oak. While the field of eastern white pine lumber has been somewhat contracted in recent years because of the diminished supply, it still has a wide range of uses. It can be used satisfactorily for practically every part of a house. Building construction was formerly the outstanding use of eastern white pine. Handsome houses built of eastern white pine in New England some

[11] The average weight of eastern white pine in an air-dry condition (12 percent moisture) is 25 pounds per cubic foot.

[12] Refers to heartwood. The sapwood of all species is low in resistance to decay.

[13] A small amount of eastern white pine in the form of short logs or bolts is cut directly into the short pieces used in making pails and tubs without being first sawed into lumber.

TABLE 1.—*Eastern white pine used in the manufacture of wooden products*

[Thousands of board feet]

Classes of products	1912	1928	1933	1940
Airplanes	----------	47	2	135
Agricultural implements	8,243	610	349	143
Boot and shoe findings	----------	1	----------	3,926
Boxes, baskets, and crating	1,120,990	556,819	[1] 337,549	[1] 516,560
Boxes, cigar and tobacco	199	860	1,011	1,308
Butchers' blocks	[2] 200	----------	----------	----------
Car construction and repair	75,288	9,040	3,328	1,494
Caskets and burial boxes	32,969	4,145	1,849	10,356
Conduits, pumps and wood pipe	14,374	2,370	335	3,009
Dairy, poultry and apiary supplies	([3])	1,285	981	4,654
Dowels and skewers	[4] 25	[4] 145	----------	----------
Electrical equipment	3,023	6,120	1,169	2,460
Fixtures	4,635	1,146	530	881
Flooring	([5])	([5])	2,784	46
Furniture	10,113	2,820	782	3,716
Handles	101	20	154	444
Instruments, musical	9,395	4,090	77	110
Instruments, professional and scientific	427	1,046	49	181
Ladders	([3])	([3])	536	280
Laundry appliances	3,027	4,572	376	----------
Machinery	7,789	201	31	450
Matches	72,810	10,673	----------	----------
Patterns and flasks	17,746	16,656	18,402	35,613
Playground equipment	37	168	11	2
Plumbers' woodwork	786	2	----------	----------
Printing material	12	1	16	3
Radio and phonograph cabinets	----------	----------	----------	168
Refrigerators	[6] 8,613	[6] 2,216	572	802
Rollers, shade and map	61,450	14,024	750	7,033
Sash, doors, general millwork	[7]1,462,143	[7] 116,863	[8] 13,537	[8] 20,791
Sewing machines	----------	50	82	----------
Ship and boat building	13,929	3,778	1,354	2,988
Shuttles, spools, bobbins, looms	[9] 130	[9] 1,097	([9])	1,278
Signs, scenery, displays	3,267	6,384	1,615	1,092
Sporting and athletic goods	805	1,154	15	48
Tanks	16,846	298	160	97
Toys	2,367	5,303	3,725	5,358
Trunks and valises	7,265	957	599	979
Vehicles, motor	([10])	712	268	351
Vehicles, nonmotor	1,648	147	1	56
Venetian blinds	([5])	([5])	([5])	----------
Woodenware and novelties	48,405	4,376	1,217	1,665
Total	3,009,057	780,196	394,216	628,477

[1] These figures for 1933 and 1940 include eastern white pine used for boxes and crates by plants not classified as manufacturers of wooden products, and which were not included in 1912 and 1928. The amounts included for nonmanufacturers of wooden products were as follows: 1933, 65,570,000 board feet, and 1940, 194,194,000 board feet.
[2] Includes skewers.
[3] Included in "Woodenware and novelties."
[4] Dowels only, skewers included in "Butchers' blocks."
[5] Included in "Sash, doors, general millwork."
[6] Includes kitchen cabinets.
[7] Includes planing-mill products such as siding, ceiling, and flooring.
[8] Planing-mill products not included in 1933 and 1940 canvasses, except flooring which is listed separately.
[9] Does not include looms.
[10] Included in "Vehicles, nonmotor."

200 years ago are still in excellent condition. In recent years, however, its place has been taken by other woods.

By far the largest quantity of eastern white pine lumber now goes into boxes for which it is especially suitable on account of its lightness, the ease with which the wood can be worked and stenciled, its nailing properties, and lack of odor. This box lumber is largely second-growth knotty material of the lower grades. The greater part of the comparatively small proportion of high-grade lumber goes into the making of patterns for castings. For this exacting use eastern white pine has long been and still is a preferred wood because of its uniform texture, fine working properties, small shrinkage, ease of gluing, ability to stay in place, and freedom from resin. High-grade pattern

stock consisting of clear, soft, wide lumber is sometimes called "cork" pine or "pumpkin" pine. Other leading uses are sash; doors; finish; trim; caskets and burial boxes; shade and map rollers; toys; dairy and poultry supplies; and boot and shoe findings. Eastern white pine has lost its place as the leading match wood to western white pine because of the comparative scarcity of material suitable for match planks.

Table 1 shows the amounts of eastern white pine used in the manufacture of wooden products in 1912, 1928, 1933, and 1940. The material used in making these products included lumber, veneer, and bolts and logs. Nearly all of it was lumber.

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